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OFFICIAL NOTICES

ACM ELECTION ANNOUNCEMENT

The Nominating Committee has proposed the following slate of Nominees:

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Middle Atlantic	FRANK ENGEL, JR., Westinghouse Electric Corp.
	SAUL GORN, University of Pennsylvania
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	JACK HELLER, New York University
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	J. J. EACHUS, Datamatic
Europe	M. V. WILKES, The University Mathematical Laboratory, Cambridge, England
	ALWIN WALTHER, Technische Hochschule 16, Darmstadt, Germany

Additional nominations may be made by petition of 15 members providing that said petition is received by the Secretary no later than April 18, 1958. Petitions should be sent directly to:

Dr. Jack Moshman
Corporation for Economic and Industrial Research
1200 Jefferson Davis Highway
Arlington 2, Virginia

Ballots will be mailed to the membership on or about April 25, 1958. In addition to the election of officers there will be a referendum on amendments to the Constitution and Bylaws.

One series of amendments is designed to make the Chairman of the Editorial Board a Member of the Council.

The following amendment to the Bylaws has been proposed which will require the Nominating Committee to nominate at least one person in addition to the present Vice-President for the office of President:

THE NOMINATING COMMITTEE SHALL NOMINATE FOR PRESIDENT OF THE ASSOCIATION THE PRECEDING VICE-PRESIDENT AND AT LEAST ONE OTHER MEMBER, AND SHALL NOMINATE AT LEAST TWO MEMBERS FOR VICE-PRESIDENT.

Inasmuch as this proposed amendment has received considerable discussion, both within and without the Council, the Petitioners and the Council have availed themselves of the opportunity to state the reasons for and against the amendment respectively.

The Petitioners state:

The petitioners feel that the present bylaws allow the nominating committee to produce an undemocratic ballot. It is the intent of the proposed change that the members shall have a choice of candidates for each of the two highest offices. The opportunity for continuity is still present, since the preceding vice-president shall be one of the two candidates for president.

It is the Council's position that:

While it is agreed that it appears undemocratic to place on the ballot only one candidate for a given office, the practice is widely followed in professional organizations, and, in fact, there are provisions permitting the inclusion on the ballot of any candidate if a sufficient number of petitioning members so request. The endeavor to achieve a more democratic form by requiring one nominating committee to select two names for each office is unrealistic, since any committee which so desires could easily stack the cards by selecting a weak and unknown candidate as ostensible opponent to their real preference; and no bylaw or amendment could prevent this.

On the other hand, any nominating committee would almost certainly welcome suggestions, and the present committee has solicited suggestions from members with very little success. A much more realistic approach would be that any member or group of members having a preferred candidate, recommend this candidate to the committee, and, if the effort fails, circulate a petition favoring the addition of the candidate to the ballot.

TECHNIQUES DEPARTMENT

IBM 704 Code-Nundrums

MURRAY GRUMETTE, Missile Systems Division, Lockheed Aircraft Corp.

These CODE-NUNDRUMS are 704 coding puzzles, each of which contains an amusing twist. They are of the same category as chess end-problems, which often present artificial positions unlikely ever to be encountered in actual play, but the study of which undeniably sharpens one's performance in real games. So these puzzles, by pointing up the potentialities of the computing machine, should benefit the programmer who admittedly will never be called upon to "replace the contents of the AC with K, without using the letter A."

Editor's Note: The inclusion of these puzzles is an experiment, inasmuch as they are restricted in interest to those who program for a specific machine. In case others are interested, the problems shown are to be solved by coding in the SAP language for the 704, which may be obtained in specification form from Mr. Franz Ross, Publications, I. B. M. Corp., 590 Madison Ave., New York 22, N. Y.

If these puzzles are well received, similar problems for other computers will be considered, as this department greatly wishes to avoid a provincial flavor. Solutions for each puzzle will be found on page 11. They are not necessarily unique, nor does this department undertake to guarantee that they will assemble and perform as advertised, although Mr. Robert Brill has inspected them and is responsible for a new solution to puzzle 2.

1. Location M contains the instruction TIX 0, 0, 10. Write ONLY 4 instructions that will increase the magnitude of the contents of the Accumulator by 10. Do not use any pseudo-instruction, nor any instruction that contains either A or S in the mnemonic operation code.

2. Location A contains the instruction HTR 8. Write ONLY 3 instructions that will load index registers 1, 2 and 4 with 2, 8 and 40 respectively. Use no Type A instruction with a decrement numerically greater than 8.

3. Write 5 instructions that will transfer control to K or L, according to whether the sign of the accumulator is plus or minus. Do not use any instruction that contains the letter T in the mnemonic operation code, except TRA.

4. Location T is known to contain a transfer instruction. In order to test this instruction and transfer to IS if it is indexable and to ISNOT if it is not indexable, what instruction should be placed in location M as a mask?

```
        CAL     T
        ANA     M
        TNZ     ISNOT
        TRA     IS
M       —       —          (Supply operation, address, tag, decrement)
```

5. Location 1471 (decimal) contains the instruction HTR 19. Write 2 instructions for a 704 with 4096 words of core storage, without using any vowel, that will replace the contents of the Accumulator with 19 and also load index register 2 with that number.

6. Given the coding:

```
W       CLA     J

        CLA     J + 1
        ADD     W + 1
        ADD     W + 2
        PAX     0, 2
        TRA     J + 2
J       HTR     12
        HTR     257
```

Write the 2 instructions for locations W + 1 and W + 2 that will cause the above sequence to load index register 2 with the value 12. Do this for the 2 cases:

a. Use no operation codes containing either a T or an A.

b. Use no operation codes containing either a T or an M.

Algorithm for Analyzing Logical Statements to Produce a Truth Function Table

HAROLD WOLPE, I.B.M. Corporation

Over the past few years, a large portion of the computer field has been tending toward large scale compilers which take a few instructions and generate many instructions in actual machine language. The ultimate of such a trend is the presentation of an actual English sentence to the computer stating what the computer is to get and what the computer is supposed to give. The computer then determines the best way to perform the function.

It is very rare that a job can be performed in which decisions are not to be made. It would be a step in the right direction, then, if we could express the basis for the decision in a logical statement and let the computer do the translation into machine language. A logical statement in this case is not an English sentence but a group of conditions which, when linked together in the proper order, form the basis on which a decision can be made.

The present paper is concerned mainly with the linkage of conditions. Work is being done on the form and analysis of individual conditions.

Given here are the theories, steps and rules necessary to analyze a logical statement of any complexity. Since each condition in a logical statement can be considered a decision maker in itself, it has associated with it a transfer of operation to analyze some other condition or perform some function decided by the overall statement. Let us call the function to be performed next a "transfer point." The purpose, then, of the analog being presented is to transform the logical statement into a table of conditions and their associated transfer points.

All the conditions are linked together with one of three logical codes or operators:

* representing "and" — representing negation

\+ representing "or"

Although the English language can give various meanings to both "and" and "or," the analog recognizes only the following meanings:

A * B (A and B) means both A and B must be satisfied before the statement is satisfied.

A + B (A or B) means that if either A or B are satisfied, the statement will be satisfied.

It is possible for both A and B to be satisfied, but this has no bearing.

This is sometimes referred to as the "inclusive" use of "or."

Each operator has a certain effect on one or more conditions. The group of conditions which an operator affects is called its "range of influence." The range of influence can be determined in one of two manners when analyzing a statement on paper:

1. The use of parentheses to group certain conditions.
2. The type of operator employed.

The use of parentheses to determine range of influence can be seen in the following two statements where the alphabetical characters represent conditions:

(a) A * B + C

(b) A * (B + C)

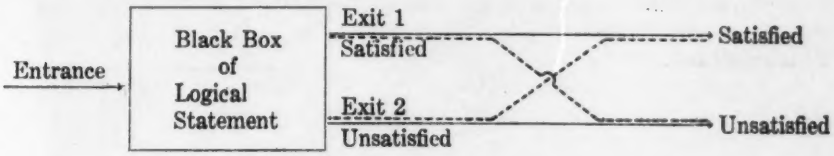
In (a) the * (and) symbol extends to B alone whereas in (b) the * (and) symbol extends to both B and C.

The type of operator can also determine a grouping and therefore the range of influence. It is always considered that the + (or) symbol is a weaker binding operator than the * (and) symbol. In the statement A * B + C * D, the * (and) symbol binds A and B together and also binds C and D together so what we actually have is (A * B) + (C * D).

The negation operator simply reverses the final decisions of its range of influence. Let us consider any logical statement as a black box. It can be seen that any group of conditions within a statement is

also a black box since the group is a statement in itself. We enter the black box to make a certain decision. There can only be two alternatives or exits out of the black box;

1. If the black box has been satisfied.
2. If the black box has not been satisfied.



When we apply negation to the black box what we are really saying is, "If the black box is satisfied, we are not and if the black box is not satisfied, we are." In essence, we simply reverse the paths of the exits, as in the dotted lines above.

Although a human could tell immediately what the grouping should be in a simple statement such as A * B+C * D, he might fail to group a very complex statement properly without the use of an algorithm. Step 1 as outlined below transforms any correctly parenthesised statement, no matter how weakly it is grouped, into a completely parenthesised, well defined statement.

The term "level" is used extensively, since in fact this whole system is based on the level of each operator and condition. The "level" of any element is simply the number of sets of parentheses which surround that element in a completely parenthesised statement. In the following statement A is level 0, B is level 1, and C and D are level 2.

A * (B + (C * D))

Operators also have their levels. The first * (and) symbol is level 0, the + (or) symbol is level 1, and the second * (and) symbol is level 2.

The object of this system is to evolve a network for determining the validity of any logical statement of any complexity in the minimum number of steps, without having to analyze any condition more than once. Many similarities exist between this system and the arithmetic scan developed for the FORTRAN automatic coding system by Peter Sheridan, who also consulted on this project.

To do this the analog uses a left to right scan to produce a left to right network of transfers. This means we always start at the left-most condition and always proceed to the right. This will be explained more fully later. The above would seem arbitrary, were it not for the fact that all of our English sentences are read in this manner.

Frequency plays a large part in determining which condition or set of conditions should be analyzed first. There are no rules given here for accepting conditions with associated frequencies, but an effort will be made to build this allowance into the system. However, let us see just what part frequency plays in a logical statement, and then let us see how we can avoid any inefficient results by using the left to right technique properly in the original formulation of the statement.

Suppose we have the statement A * B where A is a very complex set of conditions and B is a very simple condition. One might say that in the above case it would be better to analyze B first, because if we could make B fail we will not have to analyze the complex condition A. However, if B is satisfied 90 per cent of the time and A is satisfied only 10 per cent of the time, it can be seen that in the majority of the cases we will have to test A anyhow; but if we test A first, we will have to test B only 10 per cent of the time.

If instead of a 10–90 frequency ratio there was a 50–50 ratio, then we would want to analyze B first. This can still be accomplished within the technique of the left to right scan, if the original statement was written B * A instead of A * B. In other words, a very efficient scan can still be generated if the person writing the original statement places on the left all the conditions which uniquely determine the validity or non-validity of the statement and on the right those conditions which do not give such rapid determination. This is logical since a person trying to make a decision should ask the questions or seek the facts which will give the fastest decision. A more detailed discussion of a left to right scan follows.

There can be two of four possible results of any condition on any one piece of data (one if satisfied and one if unsatisfied):

1. If satisfied.
   a. It may uniquely determine that the whole statement is satisfied, or
   b. We may have to analyze other conditions TO THE RIGHT to determine if the whole statement is satisfied or not.
2. If unsatisfied,
   a. It may uniquely determine that the whole statement is not satisfied, or
   b. We may have to analyze other conditions TO THE RIGHT to determine if the whole statement is satisfied or not.

Since any of the conditions in a statement can have two of the above properties, we always move from left to right until we reach a part of the network which, based on what has come before, uniquely proves the validity or non-validity of the overall statement (i.e., satisfies 1(a) or 2(a) above).

This system, then, determines what else has to be done, if anything. As a result of this each condition is given two transfer points—one if it is satisfied and one if it is not. We call the first a Truth transfer and the second a False transfer. Since this paper deals with the evaluation of the truth function only, we are not concerned with what the transfer will be if the overall statement is satisfied or not. To represent these transfers, we use the code "TRU" to be the truth transfer and the code "FAL" to be the false transfer of the overall statement. All other transfer points will be designated by the letter of the condition which must be investigated next.

Given the statement

$$(A) + (B * (C + D))$$

The object is to set up a table giving the left to right network of transfers.

Condition	Truth Transfer	False Transfer
A	TRU	B
B	C	FAL
C	TRU	D
D	TRU	FAL

The written explanation of the table is—If A is true, then the whole statement is true since if either the substatement A or the substatement (B * (C + D)) is true, the whole statement is true. However, if A is false, then the substatement (B * (C + D)) can still be true. So we must start with a left to right check of the second substatement and analyze B. Even if B is true, the substatement (C + D) must still be satisfied before the substatement (B * (C + D)) can be satisfied, but if B is false, the second substatement (B * (C + D)) must be false. Since A had to be false or we wouldn't have been investigating B, the overall statement must be false. The same logic applies to C and D.

Appendix I contains the rules for the mechanics of the system. Following these are examples of three statements varying in degree of complexity. With each statement are the tables necessary to operate the system. Along side each statement is a place for the network of transfers as defined above. Before you read the rules, try to fill in the tables just by looking at the original statement. Then, using the rules, generate the network of transfers and compare the results. Each example has been provided with the correct tables.

The reader is to be reminded that the separation of steps and the layout of the tables is only to aid an analysis done on paper. If accomplished on a computer, many short cuts will be found. For example, it can be shown that steps 1, 2 and 3 can be done simultaneously. Also, since a logical symbol followed by a right parenthesis "*)" or preceded by a left parenthesis "(*" has no meaning, it can be seen that only one character is needed to represent either a right or a left parenthesis. If the symbol precedes a logical symbol, it must be a left parenthesis, and if it follows a logical symbol, it must be a right parenthesis. Other short cuts are possible.

Appendix I

Steps and Rules for Analyzing Logical Statements

Step 1. Expand parentheses to insure that the statement is completely grouped and well defined. Begin at the left.

Rule 1. Place left parenthesis before any element or parenthesis of the statement.
At the beginning place (.

Rule 2. When either a left or right parenthesis is encountered, replace it with two parentheses of the same type.
For each (put ((.
For each) put)).

Rule 3. When a + (r) symbol is encountered, replace it with "right parenthesis, + (or) symbol, left parenthesis."
For each + put)+(.

Rule 4. All other symbols and conditions remain in their relative positions to the original and generated parentheses.
For *, −, or a condition just put that *, −, or condition.

Rule 5. Place right parenthesis after the last element or parenthesis of the statement.
At the end place).

Step 2. Build level table for both logical operators (except negation symbol—see step 3). and conditions. Each line of the table contains an operator and its level and the condition which immediately follows that operator and the level of the condition. Since the only operator that can appear at the beginning of a statement is negation and since the negation symbol has its own table, the first line of the level table contains only the left-most condition in the statement and its level.

Rule 1. Initialize a level counter at zero and, starting from the left, increase the counter one for every left parenthesis encountered and decrease it one for every right parenthesis encountered.

Rule 2. The value of the counter at the time a negation symbol, * (and), + (or) symbol or a condition is encountered is the level of that element.

Rule 3. Check that the end of the statement has enough right parentheses to return the counter to 0.

Step 3. Build negation table. This table contains the condition which follows each negation symbol and the level of that negation symbol. Unlike the other two operators, two or more negation symbols can be associated with the same condition. Since the rules for step 3 are the same as those of step 2, they may be performed simultaneously.

Step 4. Generate the Base Table of transfer points. This table contains one column for the Truth transfer (where to go if the associated condition is satisfied) and one column for the False transfers (where to go if the associated condition is not satisfied). It is called the Base Table since it is constructed ignoring all negation symbols. If no negation symbols appear in the statement, the Base Table is the final table. Each condition is operated on individually and its two transfer points are determined by the relationship between the level of that condition and the type and level of all logical operators *following* that condition in the original statement.

Rule 1. To find Truth transfer point:

a. Look in the operator portion of the level table generated in step 2 for the next * (and) symbol whose level is numerically less than or equal to ($\leq$) that of the condition,

b. *UNLESS* a + (or) symbol is encountered first whose level is numerically less ($<$) than that of the condition. In this case replace the level of the condition with the level of the + (or) symbol. Acting as if the new level was the actual level of the

condition, continue searching for an * (and) symbol as in (a) above. This portion of the rule can be used more than once if applicable.

c. If an * (and) symbol can be found to meet the specifications of (a) above, the Truth transfer will be to the condition immediately following that symbol. (The condition is the one found on the same line of the table as the * (and) symbol.)

d. If an * (and) symbol cannot be found to meet the specifications (even if it was because of the execution of (b) above), then the truth of that condition is the truth of the whole statement. Place "TRU" in the Truth Transfer column along side the condition.

Rule 2. To find False transfer point:

a. Look in the operator portion of the level table generated in step 2 for the next + (or) symbol whose level is numerically less than or equal to that of the condition.

b. *UNLESS* an * (and) symbol is encountered first whose level is numerically less than that of the condition. In this case replace the level of the condition with the level of the * (and) symbol. Acting as if the new level was the actual level of the condition, continue searching for a + (or) symbol as in (a) of Rule 2. This portion of the rule can be used more than once if applicable.

c. If a + (or) symbol can be found to meet the specifications of (a) of Rule 2, the False transfer will be to the condition immediately following that symbol. (The condition is the one found on the same line of the table as the + (or) symbol.)

d. If a + (or) symbol cannot be found to meet the specifications of (a) of Rule 2 (even if it is because of the enactment of (b) of Rule 2), then the falseness of that condition creates the falseness of the whole statement. Place "FAL" in the False transfer column along side the condition.

It can be seen that the only difference between the rules for Truth transfers and False transfers is that wherever an * (and) symbol appears in Rule 1, a + (or) symbol appears in Rule 2 and that wherever a + symbol appears in Rule 1, an * symbol appears in Rule 2. This may be helpful in memorizing the rules.

Step 5. To modify the Base Table whenever a negation symbol is present. Each symbol is handled individually.

Rule 1. Find the range of influence of the negation symbol. Starting with the operator code in the table of step 2 which immediately follows the condition associated with the negation as per the table of step 3, look for an operator whose level is numerically less than or equal to that of the negation symbol. The range of influence covers all conditions from the associated condition to the condition immediately *preceding* the operator found above.

Rule 2. Each condition within the range of influence found in Rule 1 will have a false and a true transfer point. Out of all the transfer points, either true or false, there will only be two different points which transfer outside the range of influence of the negation symbol. (Although the same transfer can occur for more than one condition, if more than two different transfers are found going outside the range of influence, a mistake has been made.) Find these two transfer points.

Rule 3. Within the range of influence interchange the two transfers found in Rule 2. (Where the first is found, place the second and vice versa.) Leave all transfers to points within the range of influence alone.

Rule 4. A previous negation may have caused a change to the Base Table in the range of influence of the present negation symbol. Always use the changed Base Table.

Step 6. Make a list of all the conditions and their transfer points. If the transfers of one or more conditions have changed because of the presence of negation symbols, list the last changes made. If no negation symbols are present, step 6 is unnecessary because the Base Table of Step 4 is complete.

Example I. A Simple Logical Statement without Negation

I. The Statement

A * B + (C * (D + E))

II. Try to complete this table by inspection before using the system.

Condition	Truth Transfer	False Transfer
A		
B		
C		
D		
E		

III. Work area for steps (since no negation symbols are present, steps 3, 5, and 6 are not necessary).

Step 1. Expand parentheses to create a well-defined statement.

Step 2. Now use Rules to Build Level Table				Step 4. Generate Base Table	
Operator		Following Condition		Base Table	
Code	Level	Name	Level	Truth Trans	False Trans
///////	///////	A			
*		B			
+		C			
*		D			
+		E			

IV. Answers

Step 1.

(A * B) + (((C * ((D) + (E)))))

Step 2.				Step 4.	
Operator		Following Condition		Base Table	
Code	Level	Name	Level	Truth Trans	False Trans
///////	///////	A	1	B	C
*	1	B	1	TRU	C
+	0	C	3	D	FAL
*	3	D	5	TRU	E
+	4	E	5	TRU	FAL

Example II. A Simple Logical Statement with Negation

I. The Statement

$$A * - B + (C * - (D + E))$$

II. Try to complete this table by inspection before using the system.

Condition	Truth Transfer	False Transfer
A		
B		
C		
D		
E		

III. Work area for steps

Step 1. Expand the parentheses to create a well-defined statement.

Step 2. Now use Rules to Build Level Table Ignoring Negation				Step 4. Generate Base Table		Step 5. Modify Base Table for each Negation Symbol				Step 6. Compile Final Table	
Operator		Following Condition		Base Table		Neg. #1		Neg. #2		Final Table	
Code	Level	Name	Level	Truth Trans	False Trans	Truth	False	Truth	False	Truth	False
//////	//////	A									
*		B									
+		C									
*		D									
+		E									

Step 3. Build Negation Table

Negation Seq. No.	1	2
Level of Negation		
Next Condition	B	D

IV. Answers

Step 2.				Step 4.		Step 5.				Step 6.	
Operator		Following Condition		Base Table		Neg. #1		Neg. #2		Final Table	
Code	Level	Name	Level	Truth Trans	False Trans	Truth	False	Truth	False	Truth	False
//////	//////	A	1	B	C	//////	//////	//////	//////	B	C
*	1	B	1	TRU	C	C	TRU	//////	//////	C	TRU
+	0	C	3	D	FAL	//////	//////	//////	//////	D	FAL
*	3	D	5	TRU	E	//////	//////	FAL	E	FAL	E
+	4	E	5	TRU	FAL	//////	//////	FAL	TRU	FAL	TRU

Step 3.

Negation Seq. No.	1	2
Level of Negation	1	3
Next Condition	B	D

(*Continued on page 13*)

SOLUTIONS FOR 704 CODE-NUNDRUMS

1.
```
    LXD   M, 1
    LDQ   M
    RND
    TIX   * - 1, 1, 1
```

2.
```
    LXA   A, 7
    TXI   * + 1, 4, 8
    TIX   * - 1, 1, 2
```

3.
```
G   CLM
    CAS   G + 2
    PZE
    TRA   K
    TRA   L
```

4.
```
M   TXH   0, 0, 256
```

(Remember that every Type A instruction is indexable, as is every Type B transfer instruction except TSX, and that every Type B has a zero as leftmost digit of the actual operation code. Thus the necessary and sufficient condition that a transfer instruction be indexable is that the octal code begin with 0 and not end in 4.)

5.
```
W   LXD   W + 1, 2
    BCD   150 C + GB
```

6a.
```
    PSE   97
    MSE   97
```

6b.
```
    SUB   W + 2
    CAS   W + 2
```

Example III. Featuring Most of the Possibilities Found in Logical Statements

I. The Statement

$$-(A + (-B * -(-C + D))) + (-(E + G) * H) * -I$$

II. Try to complete this table by inspection before using the system

Condition	Truth Transfer	False Transfer
A		
B		
C		
D		
E		
G		
H		
I		

III. Work Area for Steps—Step 1. Expand the parentheses to create a well-defined statement

Step 2. Now use Rules to Build Level Table Ignoring Negation				Step 4. Generate Base Table		Step 5. Modify Base Table for each Negation Symbol												Step 6. Compile Final Table	
Operator		Following Condition		Base Table		Neg. #1		Neg. #2		Neg. #3		Neg. #4		Neg. #5		Neg. #6		Final Table	
Code	Level	Name	Level	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}
//////	//////	A																	
+		B																	
*		C																	
+		D																	
+		E																	
+		G																	
*		H																	
*		I																	

Step 3. Build Negation Table

Negation Seq. No.	1	2	3	4	5	6
Level of Negation						
Next Condition	A	B	C	C	E	I

IV. Answers
Step 1. (− ((A) + (((− B * − ((− C) + (D))))))) + (((− ((E) + (G)) * H)) * − I)

Step 2.				Step 4.		Step 5.												Step 6.	
Logical Code		Following Condition		Base Table		Neg. #1		Neg. #2		Neg. #3		Neg. #4		Neg. #5		Neg. #6		Final Table	
Code	Level	Name	Level	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}	T_{TR}	F_{TR}
//////	//////	A	3	TRU	B	E	B	/////	/////	/////	/////	/////	/////	/////	/////	/////	/////	E	B
+	2	B	5	C	E	C	TRU	TRU	C	/////	/////	/////	/////	/////	/////	/////	/////	TRU	C
*	5	C	7	TRU	D	E	D	/////	/////	TRU	D	D	TRU	/////	/////	/////	/////	D	TRU
+	6	D	7	TRU	E	E	TRU	/////	/////	TRU	E	/////	/////	/////	/////	/////	/////	TRU	E
+	0	E	5	H	G	/////	/////	/////	/////	/////	/////	/////	/////	FAL	G	/////	/////	FAL	G
+	4	G	5	H	FAL	/////	/////	/////	/////	/////	/////	/////	/////	FAL	H	/////	/////	FAL	H
*	3	H	3	I	FAL	/////	/////	/////	/////	/////	/////	/////	/////	/////	/////	/////	/////	I	FAL
*	1	I	1	TRU	FAL	/////	/////	/////	/////	/////	/////	/////	/////	/////	/////	FAL	TRU	FAL	TRU

Step 3.

Negation Seq. No.	1	2	3	4	5	6
Level of Negation	1	5	5	7	3	1
Next Condition	A	B	C	C	E	I

NEWS AND NOTICES

ACM Chapter News

St. Louis Chapter:

The St. Louis Chapter originated as the result of the efforts of D. J. Kaufman, the current chairman, who was instrumental in arranging a number of informal meetings during the early part of 1957 to discuss a variety of computing subjects. The local offices of Sperry Rand and IBM assisted in publicizing these meetings and have been helpful in getting the chapter rolling. The members hold technical meetings about once each month and are currently planning the publication of a brief local news letter.

The programs at recent chapter meetings have included the following: a talk by John W. Carr III; "Role of the University Computing Center" by Dr. Harvey Cohn of Washington University; "The Accountant and Data Processing" by Walter H. Hanshaw of Haskins and Sells; "Small Computer Seminar, Part I" including "The IBM 610" by George Kenny and "The Royal McBee LGP-30" by David Herrman; and "Small Computer Seminar, Part II" (a discussion of the Burroughs E-101 and the Bendix G-15). The program for the March 20 meeting has been announced as "Analog Computer Applications."

Syracuse Chapter:

Chapter plans for 1958 include membership promotion, continued participation in the Technical Societies Council of Greater Syracuse, consideration of a chapter news letter, and stimulating monthly programs. On March 26, a joint meeting with the local chapter of the Instrument Society of America will feature a presentation on an automatic method used for collecting, storing and transferring data from instruments or production lines to input media of computing machines. A presentation on the RCA BISMAC is scheduled for the April 30 meeting.

"Southwest" Chapter:

The next meeting of the "Southwest" Chapter of ACM will be held during the afternoon and evening, March 13, at the Sandia Corporation in Albuquerque, New Mexico. Papers will be presented during the afternoon, and Dr. Walter F. Bauer of Space Technology Laboratories in Los Angeles will be the evening dinner spraker. An afternoon business session will be held during which time a new name for the chapter will be chosen.

Officers for the year are: Chairman, Edward A. Voorhess, Los Alamos Scientific Laboratory; Chairman-Elect, Miss Lucille Graham, iWhte Sands Proving Ground; and Secretary-Treasurer, Gunning Butler, Jr., Kirtland Air Force Base.

Houston Chapter:

At the first meeting of 1958 the following officers were elected: President, E. I. Organick, University of Houston; Vice-President and Chairman of Program Committee, Donald Peaceman, Humble Oil & Refining Co.; Secretary, Albert Newhouse, University of Houston; and Treasurer, James A. Campise, Hughes Tool Company.

The Houston Chapter meets regularly on the fourth Wednesday of the month. At its meeting on February 26, Dr. Mitsura Terao, a Fulbright Exchange Researcher at the University of Houston Computing Center spoke on "A Semi-Digital Process Simulator."

Los Angeles Chapter:

Since the announced speaker, Mr. O. C. Levy, was unable to be present, Mr. A. B. Chisholm substituted as representative of the American Totalisator Company and delivered at the February dinner meeting an informative and witty description of its application of a Burroughs E-101 to the computation of odds and payoffs at the Santa Anita race track in California.

At the March meeting, Mr. Arnold Anex of the RAND Corporation will discuss the question "Has Business Data Processing Overshadowed Scientific Computing?"

The Los Angeles Chapter Council is now busy analyzing proposed and required revisions to the Chapter's by-laws. The efficiency of the experience carry-over characteristic of the present two-year term for chapter officers is being weighed against the sharing of honor and work possible with a one-year council membership. Whether or not the editor of the monthly chapter newspaper, the DATA-LINK, and the Head of the Board of Representatives should become council members may be decided by a vote of members. It is also a question whether the Western Joint Computer Conference representative, who is appointed by the National Chairman and who does not therefore represent the chapter as such, should automatically become a council member. Members of the council now include the following offices: Chairman, Walter Bauer of Space Technology Laboratories; Vice Chairman, John D. Madden of Systems Development Corporation; Secretary, Richard Utman of ElectroData; Treasurer, John Postley of RAND; Section Officer, Raymond Davis of B. J. Electronics; Education Chairman, Robert Rector of Space Technology Laboratories; Membership Chairman, Ben F. Handy of Litton Industries; Program Chairman, Lloyd Hubbard of IBM; Publicity Chairman, Eugene Jacobs of RAND; Publications Chairman, Frank Wagner of North American; and Symposium Chairman, Paul Armer of RAND.

Plans for a one-day technical session in the summer or early fall are underway.

University Activities and Education Programs

In the last issue of the Communications a list was started of university digital computer installations. We continue with a list of LGP-30 university installations, correct as of February 4, 1958:

Installation	*Location*	*Director*
California Institute of Tech.	Pasadena, Calif.	c/o Computing Center 1201 E. California Ave.
University of Michigan Eng. Research Institute	Ypsilanti, Michigan	J. Wildinson
Rice Institute	Houston, Texas	Dr. W. W. Akers
Louisiana Poly. Institute	Ruston, Louisiana	Dr. D. L. Johnson
Lehigh University	Bethlehem, Penn.	Professor Wm. Smith
Ohio University	Athens, Ohio	Dr. Charles Randall
University of Alberta	Edmonton, Alberta, Canada	
University of Saskatchewan	Saskatoon, Saskatchewan, Canada	

Mr. D. S. Bolitho of the ElectroData Division of Burroughs Corporation has been transferred to the International Division of Burroughs which has its headquarters in Detroit, Michigan. He will soon be in Cape Town, Union of South Africa, to help train personnel for the first DATATRON 205 to be installed abroad. While in California, Mr. Bolitho was instrumental in establishing several computer and numerical analysis courses in colleges and junior colleges in the Los Angeles area. These were (1) Pasadena City Junior College, Pasadena, California. General Survey Course in the Applications of Electronic Data Processing Machinery to Business Applications, and Coding for Digital Computers (an introduction to numerical analysis with practice on a small scale digital computer). (2) Whittier College, Whittier, California. Introduction to Digital Computers for Business. (3) San Bernardino Valley Junior College, San Bernardino, California. Electric Data Processing Methods. (4) Pomona College, Claremont, California. Introductory Coding Course for the E-101 and Datatron 205 computers. Additional information on these courses is available on request.

Professor Paul Brock of the University of Michigan is now coordinator of educational activities for the ACM. Working with Professor Brock are three committees: The Committee on Secondary Education under Dr. George Forsythe, The Committee on Higher Education under Dr. D. H. Lehmer, and The Committee on Industrial Education under Dr. Melvin Shader. Reports of their activities will appear here from time to time.

An IBM 650 computer was recently installed at the Mayaguez campus of the University of Puerto Rico. This machine is the only one of its type presently in Puerto Rico. Dr. Mariano Garcia, Chairman of the Mathematics Department, is the Director of Computing Activities. The machine will be used as an aid to teaching the computing art and also for research on such topics as agriculture, biology, chemistry, physics, engineering, mathematics, and social sciences. The University is also a member of the Oak Ridge Institute of Nuclear Studies. During the first week after installation of the Type 650, Mr. William H. Huddiford (Atlanta IBM Education Dept.) conducted an intensive refresher course in programming and operation of the machine. Since that time Mr. Nelson Hanover (New Orleans IBM Applied Science Division) has been active in giving technical assistance to Dr. Garcia and his staff.

The University of Michigan, College of Engineering, has announced a summer Intensive Course in Automatic Control scheduled for June 16 to 25, inclusive. The course is intended for engineers who wish to obtain a basic understanding of the field, but who cannot spare more than a few days for this purpose. The course will include a coherent presentation in class of the principles and application of measurement, communication and modern automatic control and provide a comprehensive set of notes which will serve as a framework for further study. There will be four hours of lecture each morning and three hours of laboratory demonstration in the afternoon. Extensive use will be made of computing, instrumentation, and servo laboratories on the campus. The role of analog computing methods will be emphasized. This course has been given in the summers since 1953. April 15 is the closing date for registration. Further information may be obtained by writing to Professor L. L. Rauch, Room 1525B, East Engineering Building, University of Michigan, Ann Arbor, Michigan.

Pennsylvania State University has announced four summer engineering seminars designed to be of value to those who now utilize computers or who contemplate future use. An "Introduction to Computer Programming" will be given June 16–21; a seminar on "Automatic Data Processing in Business and Industry" to describe available equipment and the possibilities of new designs for special applications will be given June 23–28; "Scientific and Engineering Computation" utilizing higher mathematics is the seminar subject for July 13–25; and "Mathematical Methods for Management" (including linear programming, probability and queing theory, statistical analysis, and dynamic programming) will be the topic for August 3–8. Additional details may be obtained from the Extension Conference Center, the Pennsylvania State University, University Park, Penn.

Southern Methodist University has announced the opening of a computing laboratory in a new building on its campus. A UNIVAC Scientific 1103 is jointly operated by Remington Rand as a Service Bureau to industry and by SMU as an academic service for research and training in connection with the university's new Graduate Research Center. Professors and students have free use of the machine for research and training. SMU will make the computer available to other universities and non-profit institutions on a cooperative arrangement involving only a nominal fee for overhead. Your inquiries in this regard are invited by SMU. Computer applications now underway are in the fields of engineering, mathematics, psychology, law, management, etc.

Five courses in computer science and engineering and three in business applications of the computer and other management tools will comprise the Summer Computer Program of the University of Michigan. The eight courses will be presented simultaneously from June 16–27, in Ann Arbor and will be supplemented by evening lectures and seminars on topics of broad interest. The courses to be given are as follows: Introduction to Digital Computer Engineering, Advanced Theory of Logical Design of Digital Computers, Introduction to Standard Methods of Numerical Analysis, Applications of Advanced Numerical Analysis to Digital Computer Problems, Artificial Intelligence and Digital Computer Programming, Introductory Survey of Operations Research and the Management Sciences, and Business-Type Data Processing: Recent Developments and Future Trends. Inquiries concerning the courses should be directed to Engineering Summer Conference Office, 2038 E. Engineering Building, University of Michigan, Ann Arbor, Michigan.

At Los Angeles City College this semester, over sixty people are enrolled in a new survey course, "The Mathematical Elements of Computer Coding" which includes the ideas involved in computing, numerical analysis, programming, and related topics at the sophomore level. Invited speakers from industry and local universities and colleges will be featured.

Cooperative Programming Groups

Eastern Council of Datatron Users Organization:

Dr. Ruth Goodman of Westinghouse Research Laboratories and Dr. Saul Rosen of ElectroData are representing the Eastern Council of DUO at the Universal Language for Computers meetings. The latest session was held in New York, 17–18 February.

UNIVAC Users:

The next UNIVAC Users Conference will meet in Los Angeles May 12 and 13. All UNIVAC I and UNIVAC II computer installations are invited to participate in this conference. For the meeting agenda, topics of common interest are proposed by four committees: a committee on programming, a committee on operational procedures and maintenance, a committee on systems, applications and evaluation of new equipment, and a committee on data processing administrative and managerial problems. The conference executive board prepares the meeting agenda from the committees' suggested topics. The sessions of a conference may take the form of prepared presentations, panel discussions, friendly debates, or any other vehicle which will stimulate the exchange of ideas and experiences in data processing. The agenda for the May Conference will be distributed in April. UNIVAC Users not now on the Conference mailing list may write to Dr. H. N. Laden, Chief, New Systems Development, The Chesapeake & Ohio Railway Company, 400 Terminal Tower, Cleveland 13, Ohio.

(Editor's Note: For those readers who may not be familiar with the various cooperative programming groups, we include here short resumes of the history of USE and SHARE.)

USE:

The Univac Scientific Exchange (USE) is the cooperative organization of Remington Rand UNIVAC Scientific Model 1103A users. It was conceived in December 1955, and the first official meeting was held January 9, 1956. Its purpose is the promulgation and exchange of ideas and information concerning programs for and operation of the 1103A. It is concerned with machine development and utilization of equipment for mutual benefit. Memberships are voting or non-voting, voluntary and by organization. The eleven members of USE are as follows: Bureau of the Census, Remington Rand, The Ramo-Wooldridge Corporation, Lockheed Missile Systems, Wright Air Development Center, Operations Research Office at Johns Hopkins University, Holloman Air Force Base, Applied Physics Laboratory at Johns Hopkins University, Corps of Engineers, Boeing Airplane Company, Data Reduction Division—White Sands Proving Grounds. The next meeting will be held March 26–28 in Washington, D. C.

SHARE:

On August 22, 1955 the first meeting of SHARE, a cooperative programming group for IBM 704 users, was held. Representatives of the following seventeen organizations, subsequently called charter members, attended: Boeing Airplane Company, Lockheed Aircraft Corporation in Burbank, California Research Corp., Curtiss-Wright Corporation, General Electric Company in Cincinnati, Lockheed Aircraft Corporation in Marietta, Georgia, General Motors Research, Hughes Aircraft Company, IBM in Poughkeepsie, IBM in New York, Lockheed Aircraft Corporation in Van Nuys, California, North American Aviation, Inc., in Los Angeles, National Security Agency, the RAND Corporation in Santa Monica, United Aircraft Corporation, University of California Los Alamos Scientific Laboratory, University of California Radiation Laboratory at Livermore. Douglas Aircraft Company in El Segundo was also represented at the first meeting and later became a member. There are, at present, approximately 100 members.

The name of this organization was chosen for its implied aim and with the hope that someone would devise a five-word title with the initials S-H-A-R-E. None has been officially accepted to date, although many suggestions have been received of the following type: "Society to Help Avoid Redundant Effort."

Approximately four meetings each were held in the years 1956 and 1957. Procedures and standards

were determined and a Reference Manual established. Standing committees which have been established include Mathematical Techniques, Data Processing, and Utility Program Systems.

The scope of activity for SHARE was expanded with the advent of the IBM 709 and with the universal acceptance of Fortran as a language common to both the 704 and the 709. At the 10th SHARE meeting on February 26–28 in Washington, D. C., it is proposed to divide membership into those concerned only with the 704 and those concerned only with the 709. The proposal includes a restriction that in voting on matters pertaining only to a particular machine, only the appropriate type of member will be permitted to vote. Also, the official SHARE language for distribution purposes has hitherto been confined to SAP (SHARE Assembly Program). Under discussion is the adoption of standards for distribution in FORTRAN source language and in 709 SCAT (SHARE Compiler-Assembler-Translator) language. In addition, all other 709 programming standards and machine standards are being discussed and voted upon for adoption.

GUIDE:

The election held at the January meeting of GUIDE resulted in the selection of the following officers: M. H. Grosz (Esso Standard Oil), President; R. W. Judy (Boeing, Wichita), Vice-President; and W. E. Charlton (Curtis Publishing Company in Philadelphia), Secretary. Other members of the Board are Capt. Grady Bannister (Army Signal Supply Agency), E. G. Law (North American Aviation), L. W. Calkins (U. S. Steel at Pittsburgh) and W. A. Kraegel (Northwestern Mutual Life Insurance). Almost two hundred people from the 92 member installations attended the sessions.

G-15 Users Exchange Organization:

Approximately 70 members attended the first conference of this cooperative programming group in Washington, D. C. in April 1957. Dr. J. D. Grandine, du Pont de Nemours, Pioneering Research Laboratories, was made president, and a steering committee of six people was formed. The second meeting was held in October 1957 in Chicago with over 100 members attending. A program exchange procedure has been established with 54 programs distributed to date. In January 1958 a steering committee meeting was held in Chicago. Samuel P. Irwin, Coordinator of Nuclear Activities at Holley Carburetor Company in Warren, Michigan was elected president; by-laws were adopted; and an Administrative Code was written. It is now planned to hold three-day annual meetings instead of the previous two-day semi-annual meetings. The next steering committee meeting will be held in April in Washington, D. C.

Due to the activity and urgency of the Federal Highways Program, a separate Civil Engineering Users Committee was organized with Dr. Jerry C. Chang of Richardson, Gordon, Associates in Pittsburgh, as Chairman. The committee has its own by-laws and administrative code and will hold quarterly meetings. The chairman will also serve as a member of the general G-15 Users Organization Steering Committee. The work of the C. E. committee will be coordinated with the Bureau of Public Roads and the newly formed Bureau of Public Roads program library. The next meeting is scheduled for April 21–22 in Washington, D. C.

News Items

Installations of MANIAC II computers are planned at Rice Institute in Texas, Brookhaven Scientific Laboratories, and the University of Chicago. These are in addition to the one now operating at Los Alamos Scientific Laboratories. This machine was designed by Dr. N. Metropolis and others at Los Alamos. It is unusual in having a cathode ray tube memory of the barrier grid type which stores 48 bit words. Its add time including access is 16 microseconds, and floating and fixed operations are possible.

The Occupational Analysis Branch, Bureau of Employment Security, U. S. Dept. of Labor, is currently processing occupational materials for a brochure concerned with electronic data processing jobs. Definitions of these jobs will also be included in a future edition of the Dictionary of Occupational Titles. This Labor Dept. publication defines and classifies over 23,000 jobs and is a standard reference in all local offices of the State Employment Services. Please forward any available occupational materials, such as job analyses, job descriptions, staffing charts, and descriptions of equipment to Mr. Carl A.

Heinz, Chief, Division of Placement Methods, Bureau of Employment Security, U. S. Dept. of Labor, Room 2110, G.A.O. Bldg., Washington 25, D. C.

Bendix Computer Division of Bendix Aviation Corporation has installed a large 7,000 pound electronically controlled, hydraulically operated flight table that simulates the three motions of flight (pitch, roll and yaw) and an electronic analog computer (7′ high, 21′ long with approximately 5,000 vacuum tubes and over 12 miles of signal wiring) at the Holloman Missile Development Center near Alamogordo, New Mexico. The new simulator will be used by the Simulation and Computational group (Research & Development), under the supervision of Mr. Marvin C. Green and Dr. Martin Jaenke, to determine and improve the stabilization and control characteristics of airborne equipment.

R. B. Whitney, with ALWAC for 2½ years, has joined the Western Regional office of Bendix Computer Division in Los Angeles. Mr. Whitney is a member of ACM and one of the organizers of the Northwest Computer Organization.

IBM has announced a new piece of equipment, the 632 Electronic Typing Calculator. This consists of a modified IBM typewriter coupled with an expanded high speed electronic version of a desk calculator; it has eight magnetic core storage units of up to ten digits plus sign each. "Automatic programming" is provided by an 18″ plastic type. It is designed to save manpower in operations involving combined typing and calculating such as preparation of bills and invoices.

Two BENDIX G-15 Computers and Magnetic Tape Units are aboard the USS Compass Island, the Navy's four million dollar floating laboratory. They are being used in the development and evaluation of the SINS (Ship's Inertial Navigation System) program, which is being developed to obtain heretofore unheard-of accuracy in mid-ocean position fixes—so vital when launching missiles from carriers, ships, and submarines. In the test runs held in 1957, the G-15's showed no operational impairment due to pitch, roll or vibration, even in heavy seas.

A photoscopic information storage unit was made by International Telemeter Corporation and delivered to the Rome Air Development Center, November 8, 1957. The first application of the unit was in a machine-translation system, which is now being tested by USAF. The unit had a capacity of 30 million bits and random access of 50 milliseconds, with a scanning rate of a million bits a second, per reading head.

Twelve tenants of Westbury Industrial Park at Westbury, Long Island, N. Y. have come up with what might be the answer to the large initial outlay for computers by medium and small-sized firms. In the first known experiment of its kind, these companies are sharing use of data processing equipment at a center operated by Scientific Tabulating Corp. The center features $160,000 in Remington Rand equipment and costs approximately $320,000. (Courtesy Datamation)

First production models of two new IBM computers, the 305 RAMAC and the 608, have been delivered to customers. A pair of 305's, developed and manufactured at the IBM plant in San Jose, California, were installed at the Denver operational headquarters of United Airlines. They are speeding the processing of thousands of ticket reservations made daily by the airlines' many ticket offices across the country. Another 305 is being employed in electronically controlled warehousing and distribution at Factory Motor Parts, Inc., San Francisco, California. Nuclear Company, Division of Union Carbide Corp. in Oak Ridge, Tennessee, now has a 608 in use. It is operated with over 3000 transistors but without a single vacuum tube. The 608 is being used to prepare payroll and accounting reports for all three of Union Carbide's Oak Ridge plants. (Courtesy Datamation)

Packard-Bell Computer Corporation in Los Angeles has introduced a high-speed digital computer that provides for real-time computation and simulation of dynamic systems. Called Trice (transistorized real-time incremental computer, expandable), it is composed of independent computing elements that perform 100,000 complete computations each second. (Courtesy Datamation)

Electronic Brain Enterprises, Inc., in Salt Lake City has introduced a new desk-size computer, Minilog, that will add, subtract, multiply, integrate, differentiate, and solve algebraic, differential, and simultaneous differential equations. Easy to work with, plug-in components enable any high school student with a knowledge of algebra to set up complicated equations. Yet, the new unit will solve many equations in advanced scientific or mathematical fields. (Courtesy Datamation)

Chrono-log Corporation in Philadelphia has announced a digital clock, Model 2600, that produces multiple, digital representations of time to the nearest second, suitable for providing time data to logging systems, data handling systems, and computers. (Courtesy Datamation)

RAMACADE, a nationwide traveling business show featuring IBM electronic office equipment, is off on a four-month swing across the nation. Products on display include a new desk-size computer; the IBM 632 electronic typing calculator which performs as a combination computer-typewriter; a new pocket-sized card punch known as the Port-A-Punch, and the 8200 time punch which automatically punches IBM cards during the recording operation; and the main attraction, IBM's 305 RAMAC data processing system. RAMAC (Random access memory accounting and control) is a record-keeping concept known as continuous or "in-line" accounting. (Courtesy Datamation)

Low temperature physics research work being conducted by The Ramo-Wooldridge Corporation in Los Angeles has resulted in the development of a very high-speed computer memory element. The newly developed device, called a Persistor, is a miniature bi-metallic printed circuit which operates at a temperature within a few degrees of absolute zero. It requires very little power for operation, and has been designed with switching time as short as 10 milli-microseconds. The Persistor was invented by Dr. E. C. Crittenden, Jr. Research on the project was carried out by Dr. Crittenden and Dr. F. W. Schmidlin. (Courtesy Datamation)

The ALWAC Corporation, Hawthorne, California has announced the installation of an ALWAC III-E electronic data processing system at the Menasco Mfg. Co., Burbank, California. It will be used for numerical control of machine tools as well as standard accounting and payroll applications. This application will employ the new ALWAC Numerical Control Program (NUCOP 1), a general routine designed to prepare from blueprint information a punched paper tape to direct a three dimensional numerically controlled milling machine in a continuous path operation, through any mathematically definable or approximable surface in three variables.

ALWAC is also delivering the first of its high-speed magnetic tape transports for the ALWAC III-E to the Personnel Research Division of the Adjutant General's Office in Washington, D. C. Thirty magnetic tape units are scheduled for delivery to new and existing installations by the second quarter of 1958. A maximum of 16 of these units can be installed with a single ALWAC III-E, and each unit may simultaneously search at 16,992 characters per second while the computer is in a continuing processing cycle. Each unit may contain 15,000 32-word blocks of information to supplement the 8192 word drum memory of the basic ALWAC III-E.

Robert C. Wigger, former IBM Sales Representative, is now Assistant Manager of the IBM Los Angeles (Western) office.

During the summer and fall of 1958, a Datamatic 1000 large-scale electronic data processing system will be delivered to Los Angeles County for use in the property assessment and tax accounting work of the Assessor's Office. The equipment will include a 900 card-per-minute card-to-tape converter, two 900 lines-per-minute printers, and ten magnetic tape units. The system will be capable of reading, writing (60,000 decimal digits per second), and computing simultaneously. The County installation will be under the direction of Mike Solo. Dick Wallace, formerly with the General Electric programming staff at Lynn, and Bill Frymire, an ex-member of RAND Corporation's SAGE programming group, have been assigned to assist in the County's programming effort.

A Western Regional sales office for Datamatic has recently been opened in California under the direction of Samuel J. Wiegand, Western Regional Sales Manager.

At the February 11 meeting of the Los Angeles Chapter of the American Institute of Electrical Engineers, Dr. Richard Bellman, RAND Corporation mathematician, and a consultant for the Atomic Energy Commission, and Booz, Allen and Hamilton, spoke on "Digital Computers and Experimental Mathematics."

Thompson Products, Inc., Cleveland, Ohio and The Ramo-Wooldridge Corporation have announced jointly the formation of a new subsidiary corporation to be known as Thompson-Ramo-Wooldridge Products, Inc. Offices will be maintained at the Ramo-Wooldridge El Segundo facility near the Los Angeles International Airport, and the manufacturing facilities of the Ramo-Wooldridge Denver, Colorado

plant, will be utilized. Work will be in the field of computer design and applications for industrial process control. The new organization is now marketing, as its first major product, the RW-300 digital control computer, the nation's first process control computer. The first installation of an RW-300 was made at The Texas Company's Port Arthur refinery to control a polymerization unit.

Contributed papers for the 13th Annual meeting of the ACM to be held June 11, 12 and 13 at the University of Illinois at Urbana, Illinois, are being submitted to Professor Jim Douglas, Jr., Dept. of Mathematics, Rice Institute, Houston, Texas. Abstracts of accepted papers will appear in the program of the meeting, and the summaries will appear as preprints which will be distributed at the time of the meeting and at no other time.

At the February 21 dinner meeting of the Los Angeles Digital Computers Association, the members heard a lively debate: "Resolved that a Computer Installation Should be Open Shop." The affirmative was presented by Elliott Nohr of Rocketdyne and Dale Hanks of North American Aviation; Roy Rigsby of Lockheed's California Division and David Young of Space Technology Laboratories spoke on the negative side. At the conclusion a vote determined that the negative team won. This vote, however, probably reflected the sentiments of the group more than the abilities of either debate team.

(Editor's Note: In our last issue we included the results of the election of officers for the Los Angeles Digital Computers Association. The name of the new Chairman, Paul Armer, of RAND Corporation, was inadvertently omitted from the list. Our apologies to Mr. Armer and to DCA.)

Abe Perez, formerly of National Cash Register, is now on the staff at Litton Industries in Beverly Hills, California.

Dr. Harry D. Huskey, associate professor in engineering and associate professor in mathematics at the University of California at Berkeley, is technical director of a newly formed Bendix Computer Division Advanced Programming Development Group located in Berkeley, California. This group is currently engaged in developing compilers for the G-15D general purpose computer system. Dr. Huskey has served as consultant to Bendix since 1953 and is largely responsible for the logical design of the G-15.

In Palm Springs, California, in January 1958, two desk-size Burroughs E-101 computers were used at the Supermarket Executive Development Conference to electronically plot and rate management decisions in the operation of mythical supermarket chains. Competing executives, starting with the same share of business volume and identical operating statistics (number of stores, overhead costs, etc.), saw the results of their decisions to increase or decrease advertising, to raise capital through loans, etc. as printed financial statements—solid evidence of the success or failure in management.

Remington Rand has announced its new "UNIVAC High Speed Card Printer." This machine inputs cards at the rate of 150 per minute, apparently from magnetic tape input. Punching and printing can be performed with 13 lines and a total of 70 printed characters on each card with a printing speed of 900 lines per minute. A 5,000 word drum storage is included in this system and arithmetic operations such as addition and subtraction can be accomplished by means of an internal stored program. (Courtesy Computing News)

The Monroe Company has announced its new Monrobot IX which will sell for less than $10,000. This new computer has 14 registers of 18 digits each. The operator can select any one of eight programs of 52 steps each. The Monroe Company has recently merged with Litton Industries. Litton Industries markets a typewriter size digital differential analyzer which sells close to $10,000. (Courtesy Computing News)

Electronic Engineering Company of California announces the availability of a machine to translate from a magnetic tape of almost any computer to the magnetic tape of almost any other computer. Parts of this "magnetic tape language translator" can also be used to translate between paper tape, punched cards, converters, etc., and can output to magnetic tape, line printers, paper tape, cards or plotters. (Courtesy Computing News)

On February 2, an electronic data processing system for record keeping in the garment industry was announced. It was developed by S. J. Capelin Assoc., Inc., sewn products industrial engineers, working together with Royal-McBee Corporation and Friden, Inc. The Capelin firm demonstrated the system at the Production-Management Clinic of the International Association of Garment Manufacturers in

New York. The system, field tested for a year, uses a Royal-McBee LPG-30, together with Friden paper tape equipment such as the Computyper and the Flexowriter. (Courtesy Computing News)

On January 10 the Burroughs Corporation announced that it is the builder of the electronic guidance computer used in the U. S. Air Force Atlas ICBM test program at Cape Canaveral, Florida. The guidance system, successfully used in recent Atlas launchings, is a prototype of production models which Burroughs will build in Detroit for the Air Force. Design, development, and assembly of prototypes have been carried out in the Burroughs Labs in the Philadelphia area. (Courtesy Computing News)

First financial institution in the middle west to have a complete electronic computing system will be the Michigan National Bank. It has contracted with the Burroughs Corporation for installation of a complete 220 electronic computer bank system to process all commercial accounts, installment loans, mortgage loans, and savings accounts. The Burroughs system has been designed so that each individual office retains autonomy; all original records for each account will stay in the individual bank office. Coded punched paper tape will be used as computer input to produce overnight detailed figures on the operation of each department of each of the seven individual offices. Installation of the system will take several months, though work on the first units of equipment is already underway. The system was adopted on the recommendation of a special committee of bank officers who studied various methods for over a year. (Courtesy Computing News)

The Applied Math Department of ElectroData Division of Burroughs Corp. in its January Technical Memo published a brief introductory description of the various automatic programming systems which ElectroData will supply to users of the Datatron 205. Included among these are assemblers, compilers, and interpreters. Semi-automatic coding (SAC) is an assembler providing a one-to-one translation from pseudo codes to machine codes. The Tape Subroutine Compiler (TSK) inserts with a program the designated subroutines from library, compiling the whole into one routine punched out on paper tape. Datacode I uses three-address instructions in pseudo code with sub-routines being entered by these codes. The Purdue Compiler uses macro-language statements in its pseudo code, each of which, in general, results in a set of machine language instructions. This Technical Memo will be of interest to users of the Datatron 205, and other machines of similar size. A copy may be requested from your local Burroughs representative. (Courtesy Computing News)

Computing News is a news letter publication of considerable interest and use to computing people. Short articles on equipment and techniques are published. Inquiries concerning this publication can be made to Mr. Jackson W. Granholm, publisher and editor, Computing News, 12805 64th Avenue South, Seattle 88, Washington.

The Approximation News Letter published by Cecil Hastings, Jr., which was sent out to a special distribution, is now a part of Computing News. The Approximation News Letter contains comments on curve fitting and approximation techniques.

Don Furth of IBM's Los Angeles office has been promoted from machine specialist to Applied Science Field manager. At his new office in San Francisco he will have charge of IBM Applied Science activities for the northern part of the western United States, Alaska and Hawaii.

Computer conferences are becoming a family affair. An extensive program of scheduled activities has been planned for *ladies* attending the Western Joint Computer Conference May 6–8 in Los Angeles. A bus tour inside 20th Century Fox Studio, a fashion show and luncheon at the Beverly Hills Hotel, and extensive Hollywood sight-seeing are scheduled for May 6. The ladies will see the entire show at Marineland of the Pacific, largest of the three Oceanaria in the world; they will lunch at The Plush Horse in Redondo Beach and see an Arthur Murray "Cavalcade of Dance" on May 7. Attendance at these functions is in some cases limited so early ticket procurement is prompted. Thursday, May 8 has been left open for the ladies' own plans—shopping, visiting Disneyland, the Huntington Art Gallery, the Farmer's Market, or television studios. Co-chairmen for the Ladies' Activities are Nan Glennon of Space Technology Laboratories and Billie Keesey of Telemeter Magnetics, Inc.

Worcester Polytechnic Institute is sponsoring a Computer Conference to be held on its campus on April 15–16, to help acquaint the people in the area with computing technology. Five computer manufacturers (McBee, Bendix, Burroughs, IBM and Remington Rand) are cooperating by setting up displays and furnishing speakers. An address on "Computing in the Aircraft Industry" will be delivered

by Mr. W. A. Ramshaw, Assistant Head of the Machine Computation Laboratory, United Aircraft Corporation. Some of the displays will remain for special demonstrations on April 17.

Contributed papers for the July 24–25 Denver Research Institute 5th Annual Symposium on Computers and Data Processing are now being solicited by Mr. C. A. Hedberg, Head of Electronics Division, Denver Research Institute, University of Denver, University Park, Denver 10, Colorado.

On January 30 the Southwest Management Controls Department, headquartered in the Dallas office of Peat, Marwick, Mitchell & Co., held a seminar for top management personnel of the Petroleum and Natural Gas Industry on the subject of electronic computer applications. The proceedings of the seminar will be published by the Peat, Marwick, Mitchell & Co., Republic National Bank Bldg., Dallas 1, Texas. (Contact Mr. Lewis C. Maull.)

The American Management Association has announced seminars on Electronic and Integrated Data Processing and Machine Accounting Systems to be held March 31–April 2 in New York, May 14–16 in New York, June 4–6 in New York and June 9–11 in Chicago. For further information on program and fees contact American Management Association, Inc., 1515 Broadway, Times Square, New York 36, N. Y.

A Symposium on Numerical Approximation sponsored by the Mathematics Research Center, U. S. Army, will be held April 21, 22 and 23 at the University of Wisconsin, Madison. Topics for the symposium include linear approximation, interpolation, Tschebycheff and other extremal approximation, expansions, and algorithms. One hour surveys (including a survey of recent Russian literature) and 30 minute research papers will be presented. The following speakers from abroad have agreed to participate: L. Collatz, L. Fox, Z. Kopal, C. P. Miller, A. Ostrowski and E. L. Stiefel. The proceedings of the symposium will be published in book form. For information, contact Professor R. E. Langer, Director, Mathematics Research Center, U. S. Army, 1118 W. Johnson Street, Madison 6, Wisconsin.

"Recent Advancements in Programming Methods," a Second Annual Symposium, was announced recently by the Central Ohio Association for Computing Machinery. The one-day symposium will be held on the campus of the Ohio State University at Columbus, Ohio, on Saturday, March 29. The program of speakers includes: H. Grosch, John Mauchley, E. Yowell, F. Engel, J. Wegstein and J. Carr. Sponsoring organizations of the Central Ohio ACM, which is not affiliated with the National ACM, include Battelle Memorial Institute, Ohio State University, North American Aviation, Nationwide Insurance, and several other Central Ohio concerns. Dr. B. L. Schwartz, Battelle Memorial Institute, 505 King Avenue, Columbus 1, Ohio has been handling arrangements.

The following conference committee has been established for the International Conference on Scientific Information to be held in Washington, D. C., November 16–21 of this year: Chairman, Dr. W. W. Atwood, Jr., National Academy of Sciences-National Research Council; Dr. B. W. Adkinson representing the National Science Foundation; Dr. M. O. Lee representing the American Documentation Institute; Program Chairman, Mr. C. I. Campbell of Rockefeller Institute; Chairman of Local Arrangements Committee, Mr. H. J. Dubester of the Library of Congress; and Chairman of Exhibits Committee, Mr. J. C. Green of the Department of Commerce. Program information may be obtained from the Secretariat, International Conference on Scientific Information, National Academy of Sciences, 2101 Constitution Avenue, N. W., Washington 25, D. C.

Coming Events

Nuclear Congress
March 17–21, 1958; International Amphitheater, Chicago, Ill.

IRE National Convention
March 24–27, 1958; New York Coliseum and Waldorf-Astoria Hotel, New York City, New York

USE Meeting
March 26–28, 1958; Washington, D. C.

Second Annual Symposium, Central Ohio ACM
March 29, 1958; Ohio State University, Columbus, Ohio
Sponsor: Central Ohio ACM
Contact: B. L. Schwartz, Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio

Tenth Annual New Jersey Symposium on Control Systems Engineering
April 1, 1958; Newark, New Jersey

Symposium on Electronic Waveguides
April 8–10, 1958: Auditorium, Eng. Societies Bldg., New York City, N. Y.
Sponsor: Polytechnic Inst. of Brooklyn in cooperation with IRE Professional Group on Electron Devices and Professional Group on Microwave Theory Techniques
Co-Sponsors: Department of Defense Research Agencies

Computer Conference
April 15–16; Worcester Polytechnic Institute, Worcester, Massachusetts
Sponsor: Worcester Polytechnic Institute

American Mathematical Society Meetings
April 18–19, 1958; Chicago, Illinois
April 18–19, 1958; Stanford, California

Symposium on Numerical Approximations
April 21–23, 1958; Mathematical Research Center, Madison, Wisconsin
Contact: Professor R. E. Langer, 1118 W. Johnson St., Madison 6, Wisconsin

1958 Electronic Components Conference
April 22–24, 1958; Ambassador Hotel, Los Angeles, California

American Mathematical Society Meeting
April 25–26, 1958; New York City, New York

Fourth National Flight Test Symposium
May 4–7, 1958; Park Sheraton Hotel, New York City, N. Y.
Sponsor: ISA

National Symposium on Microwave Theory and Techniques
May 5–7, 1958; Stanford University, Stanford, California

Western Joint Computer Conference—"Contrasts in Computers"
May 6–8, 1958; Ambassador Hotel, Los Angeles, California
Contact: Dr. Willis Ware, The RAND Corp., Santa Monica, California

Los Angeles Chapter ACM Symposium "Small Automatic Computers and Input-Output Equipment—A Report from the Manufacturers"
May 9, 1958 (the day following WJCC); Ambassador Hotel, Los Angeles, Calif.
Contact: P. Armer, The RAND Corporation, Santa Monica, California

1958 National Telemetering Conference
June 2–4, 1958; Lord Baltimore Hotel, Baltimore, Maryland
Sponsors: ISA, IAS, AIEE

Computer and Automation Conference
June 2–4, 1958; University of Texas, Austin, Texas
Sponsor: University of Texas

Fourth International Automation Exposition and Congress
June 9–13, 1958; Coliseum, New York City, N. Y.

1958 ACM National Conference
June 11, 12, 13, 1958; University of Illinois, Urbana, Illinois

American Mathematical Society Meeting
June 20, 1958; Corvallis, Oregon

Fifth Annual Symposium on Computers and Data Processing
July 24–25, 1958; Denver Research Institute, Denver, Colorado
Sponsor: Denver Research Institute
Contact: C. A. Hedberg, Denver Research Institute

WESCON
August 19–22, 1958; Ambassador Hotel and Pan Pacific Auditorium, Los Angeles, California

American Mathematical Society—63rd Summer Meeting
August 25–30, 1958; Cambridge, Massachusetts

The Mathematical Association of America—39th Summer Meeting
August 25–28, 1958; Cambridge, Massachusetts

SHARE Meeting
September 10–12, 1958; San Francisco, California

1958 National Simulation Conference
October 23–25, 1958; Statler-Hilton Hotel, Dallas, Texas
Sponsors: IRE-PGEC and Dallas Section of IRE
Contact: Louis B. Wadel, 3905 Centenary Drive, Dallas 25, Texas

American Mathematical Society Meeting
November, 1958; Evanston, Illinois

International Conference on Scientific Information
November 16–21, 1958; Mayflower Hotel, Washington, D. C.
Sponsor: National Academy of Sciences, National Research Council, National Science Foundation, American Documentation Institute
Contact: Secretariat, International Conference on Scientific Information, National Academy of Sciences, 2101 Constitution Ave., N. W., Washington 25, D. C.

Eastern Joint Computer Conference
December 1958; Boston, Massachusetts

American Mathematical Society—65th Annual Meeting
January 20–22, 1959; Philadelphia, Pennsylvania

Joint Meeting of Institute of Mathematical Statistics (Central Region) and the Association for Computing Machinery
April 2–4, 1959; Case Institute of Technology, Cleveland, Ohio
Contact for IMS: Martin B. Wilk, Bell Telephone Laboratories, Murray Hill, New Jersey
Contact for ACM: Daniel Teichroew, National Cash Register, Dayton 9, Ohio

1959 ACM National Conference
Summer, 1959; Massachusetts Institute of Technology, Cambridge, Mass.
Contact: F. Verzuh, MIT